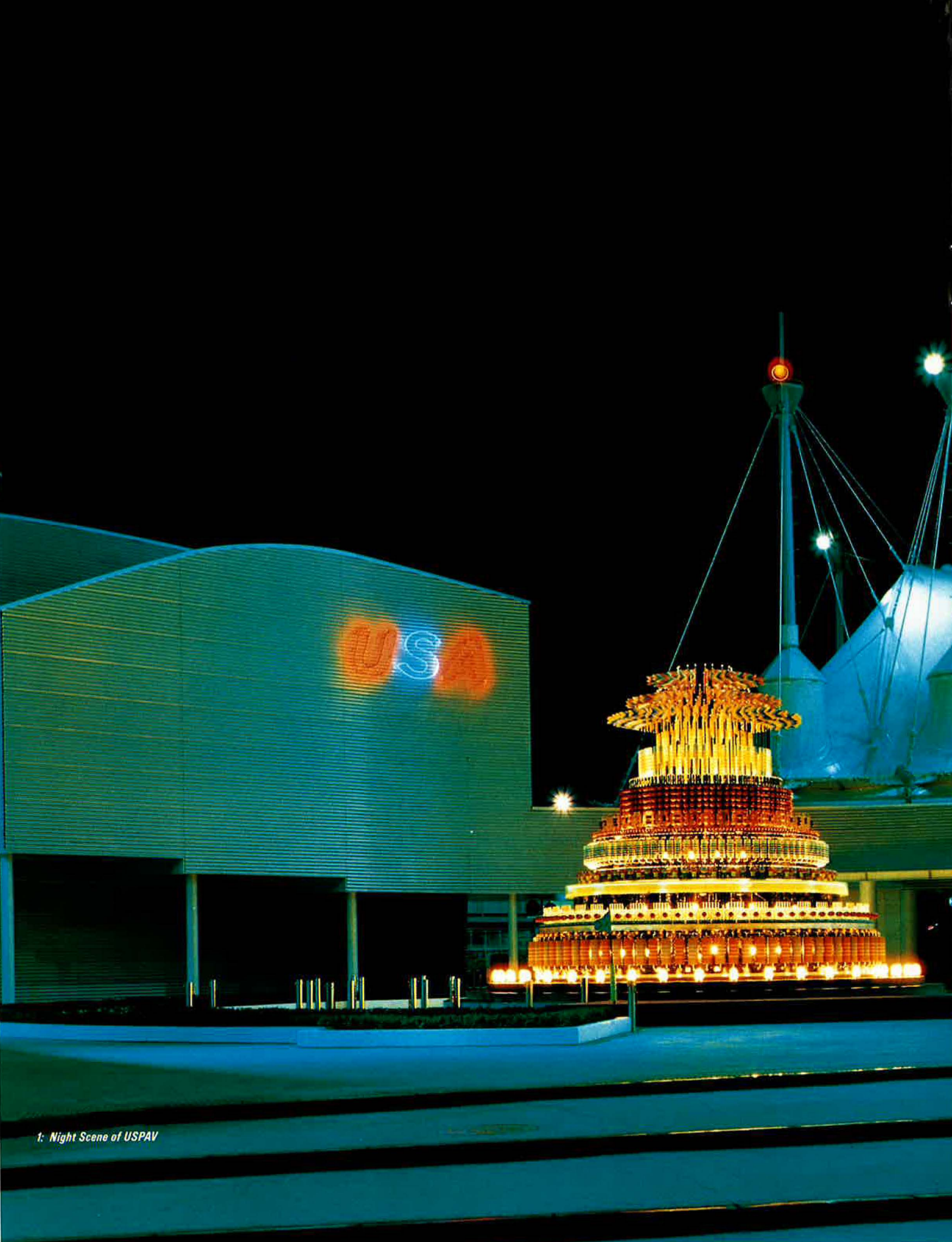


Final Report United States Pavilion Tsukuba Expo '85

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1: Night Scene of USPAV





2. Ambassador James J. Needham, Commissioner General of the United States Pavilion, addresses Expo '85 opening ceremony. Mr. Needham also served as Chairman of the Steering Committee, the governing body of all international participants at Expo '85.

Dear Mr. Wick:

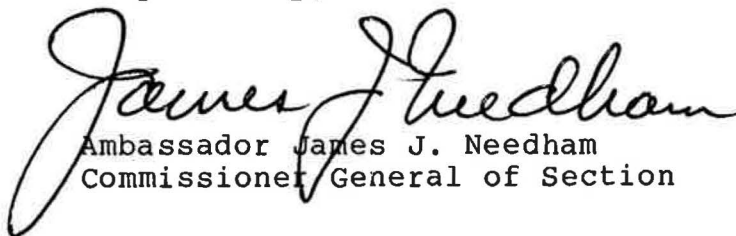
It is my pleasure to transmit to you the final report for the United States Exhibition at Tsukuba Expo '85. There are two matters related to this project on which I want to focus your attention.

The first has to do with the private sector's support of the project which distinguishes the U.S. participation in the Tsukuba Expo from those which preceeded it. Specifically, contributions of approximately 44 percent of the total project cost were received from the private sector. Without this level of support, the United States participation on the scale described in the report would not have been possible, nor would we have realized the surplus of revenues over expenditures. Both the level of support and the surplus, I am told, are without precedent.

Secondly, I want to formally acknowledge the superb dedication and effort of everyone connected with the project, the significant support received from H.E. Ambassador Mike Mansfield, the staff of the Embassy and the U.S.I.S. staff.

Finally, I believe our participation in Expo '85 was a major contribution in our on going efforts to strengthen our bilateral relationship with the people and government of Japan.

Respectfully,



Ambassador James J. Needham
Commissioner General of Section

The Honorable
Charles Z. Wick
Director
United States Information Agency



Preface

Every international exposition is an adventure in communication. It is a festival, a showcase of culture and science, and a marketplace of ideas. The U.S. participation at Tsukuba Expo '85 was nonetheless an unusual challenge.

"Artificial Intelligence: Amplifying the Mind," the theme selected for the U.S. Pavilion, addressed one of the greatest challenges of our times: mankind's search for a machine that will learn, discard obsolete knowledge, make rational choices, deal simultaneously with several complex issues and—so to speak—"think." The quest transcends more predictable areas of scientific research and continues to test the best minds in science and technology.

Like "the taming of fire, the invention of the wheel and the widespread adoption of machines," said President Ronald Reagan, "the development of artificial intelligence will doubtless someday be seen as a quantum leap in man's ability to shape his world."

What is being done in artificial intelligence (AI) laboratories, however compelling its depth and scope, is little understood by other than the specialists. Artificial intelligence is a complex theme to present in an exhibition pavilion directed largely to a non-technical world exposition audience, but there were reasons sufficient to offset the risk.

Underlying its presentation were two of the United States' most cherished traditions, the free flow of information and individual freedom: Let the world know what the United States is doing; combine our efforts with those of other nations; compete in the marketplace of ideas; and mankind will reap the rewards.

During the six-month period that the fair was open, from March 17 to September 16, 1985, the U.S. Pavilion attracted approximately five million visitors, a fourth of the total Expo attendance. Surveys and press comments ranked the U.S. Pavilion high in popularity among all other pavilions at the fair.

The U.S. Pavilion offered to those seriously interested in technology a treasure trove of techno-wizardry under one roof. It presented the latest expert systems, ranging from a computer that, in seconds, solved symbolic problems in higher mathematics, to another that solved Rubik's cube puzzles; from *Aaron*, an artificially intelligent "artist," which tirelessly produced about one thousand original drawings each month, to a computer-composer which created jazz tunes. "This is the one place in the whole fairground where I find *real* high tech," said a Tsukuba University student.

American participation at Tsukuba was a challenge from the point of view of funding as well. Ambitious efforts to involve the private sector not only encouraged four major corporations to join the U.S. government in its Pavilion, but also resulted in contributions exceeding \$6 million, or over 40 percent of the federal appropriation. This made Tsukuba Expo '85 the single most successful example to date of U.S. Government and corporate collaboration at a world's fair.



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Background

Spotlighting science and technology in Tsukuba was an idea dating back to 1963. The Japanese Government's Science and Technology Agency (STA) chose the rice-growing district in Southern Ibaraki Prefecture as the site for an unusual scientific community. This national project had two objectives: to counter overcrowding in Tokyo 37 miles away and to meet escalating needs for research and technology in the new and growing "sunrise technologies."

Aerological Observatory, Electrotechnical Laboratory, Tsukuba Space Center, Fruit Tree Research Station, National Institute of Animal Health, Japan Automobile Research Institute—these are some of the research institutes established in Tsukuba over the last two decades. They have drawn scientists and engineers to the area, boosting its population from 86,000 in 1960 to 145,000 in 1985. Today, Tsukuba Science City encompasses six towns and villages; it has 46 national research facilities and more than a third of Japanese government research manpower.

A world's fair in Tsukuba served as a catalyst to the development of the community and provided the Japanese with an opportunity to enhance the nation's reputation in technological innovation. On September 22, 1978, STA announced a plan for an international exposition in Tsukuba.

Tsukuba Science City, Japan's model in urban planning, is roughly half the area of Tokyo. Approximately \$5.3 billion had been spent on the construction of this scientific community and its government-funded laboratories. A brand new expressway, linked to Tokyo's metropolitan system, gave the area access it never had before.

The Expo site itself was designed to inspire future city planners by an amalgamation of technology and nature; in laying it out, designers had in mind the basic requirements of an ultramodern industrial park, which it was destined to be at the closing of the fair.

The theme chosen for Tsukuba Expo '85 was "Dwellings and Surroundings—Science and Technology for Man at Home."

The Expo '85 organizer—Japan Association for the International Exposition, Tsukuba, 1985 (JAIET)—summarized the concept behind the choice:

Information and communication systems are an indispensable part of man's social activities, and, in fact, are the life blood of contemporary living systems. Applying these systematic and historical analyses, this Expo is designed to provide an opportunity to deepen understanding of the relationship between dwellings and surroundings and mankind, science and technology.

It is also one of the major objectives of this Expo to contemplate and integrate the future development of various elements of the systems in an attempt to search for desirable dwellings and surroundings in the future.

Appropriately, the subthemes of the exposition were "Individual and Mass Communications," "Accumulation and Use of Information in Society" and "Communications Systems."

The proposed theme was approved by the Bureau of International Expositions (BIE) in Paris on June 12, 1980. Ten months later, on April 22, 1981, the international organization vested with the authority to approve official world's fairs by the Paris Convention of 1928 sanctioned Tsukuba Expo '85 as a specialized world's fair. This made Expo '85 the third official international exposition to be held in Japan—after the Osaka Expo '70 and the Okinawa Ocean Expo '75.

All world's fairs registered by BIE fall into two categories, universal and specialized. The latter is normally smaller in scale as it devotes itself to a single theme. But Tsukuba Expo '85 was the largest show in scale, participation and attendance since Osaka Expo '70, a universal exposition which drew a record crowd of over 64 million visitors.

JAIET had set a goal of 20 million visitors to Expo '85 before the fair began. Attendance reached this target two days before closing. The final visitor count, at the end of September 17, was 20,334,727, of which an estimated 755,000 were foreign visitors.

Forty-seven countries and 37 international organizations, including the United Nations and the European Community Commission, participated in Expo '85. As one characteristic of Expo '85, developing countries from Africa and the South Pacific were extremely well represented. (See International and Corporate Participants on page 37.) Including the official Japanese Government participation, represented in four exhibit facilities, the total number of participating countries at Expo '85 was 48. An additional 28 Japanese corporations and organizations took part.





U.S. Participation

Japan's invitation to the Government of the United States to participate in Tsukuba Expo '85 on October 30, 1981, was referred to the United States Information Agency (USIA), authorized under the Fulbright-Hays Mutual Education and Cultural Exchange Act (Public Law 87-256) to produce U.S. exhibitions at BLE-approved international expositions abroad.

From the point of national interest, there were sufficient reasons for the U.S. to participate in a science and technology exposition hosted by Japan. Fundamentally sound relations between Japan and the United States were undergoing readjustment because of Japan's enhanced position as a world economic power and the resulting bilateral friction with the U.S. over trade and defense policies. U.S. participation would imply a continued spirit of cooperation with an important ally and provide clear support to its relationship.

Moreover, participation could "show dramatically and conclusively that the U.S. is the vanguard of scientific and technological development and intends to stay there." It could "show that the United States is the laboratory for an

advanced, post-industrial, information-intensive society, and that American innovations will provide a new social, economic and political experience which will be pertinent to other cultures." It could also "announce the American conviction that the free flow of all types of information is required for peace, for the productive use of earth's resources and for development of the human mind." (From *Tsukuba Expo 1985: Policy Objectives of U.S. Participation*, November 9, 1982.)

On June 16, 1982, Charles Z. Wick, the Director of USIA, wrote a letter to accept "in principle" the Japanese Government's invitation, subject to the appropriation of funds by the Congress.

USIA proposed a 30,000 square foot exhibition for the six-month fair, to be funded by \$12 million in appropriated funds, plus contributions from the private sector.

Initially, USIA was authorized to seek an appropriation of \$4 million, which was provided as part of the FY 1983 supplemental (P.L. 98-93). The FY 1984 appropriation (P.L. 98-166) contained another \$3.6 million. An additional \$965,000 was allocated to the exhibit by reprogramming for a total appropriated input of \$8.565 million.

Cash contributions, concessions, space rental fees, and reimbursements

provided another \$1,548,800, of which \$971,000 was applied to the U.S. exhibition and \$577,800 was made available for other USIA exhibits activities, thus reducing the need for appropriations in subsequent years. In addition, the private sector generously contributed materials and services valued at \$5,848,143. With these contributions included, the value of the resources applied to the U.S. exhibition in Tsukuba totaled \$15,383,200.

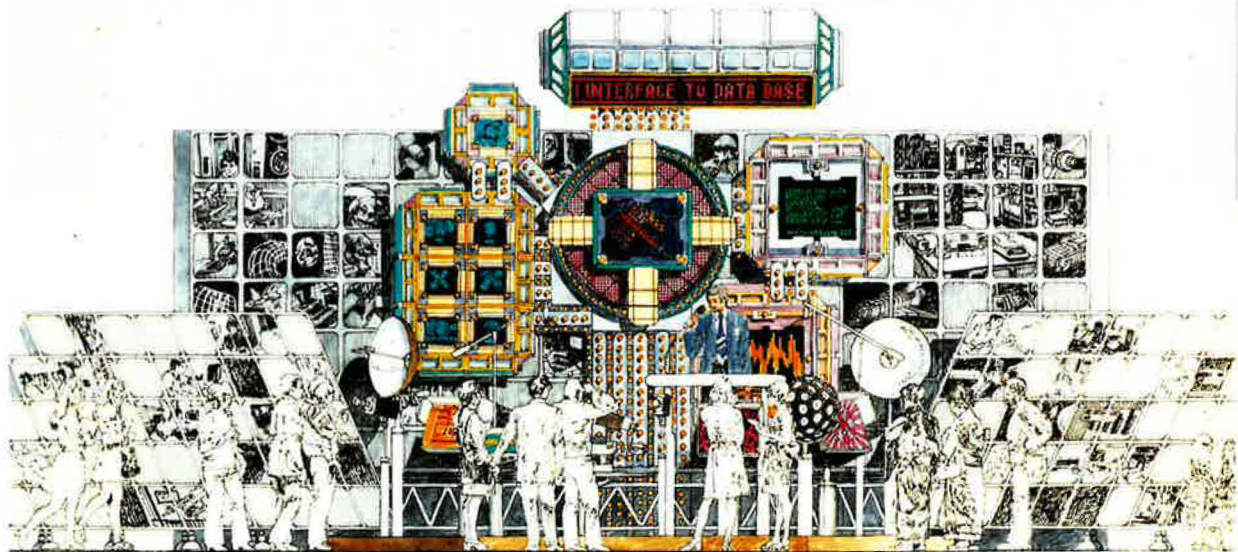
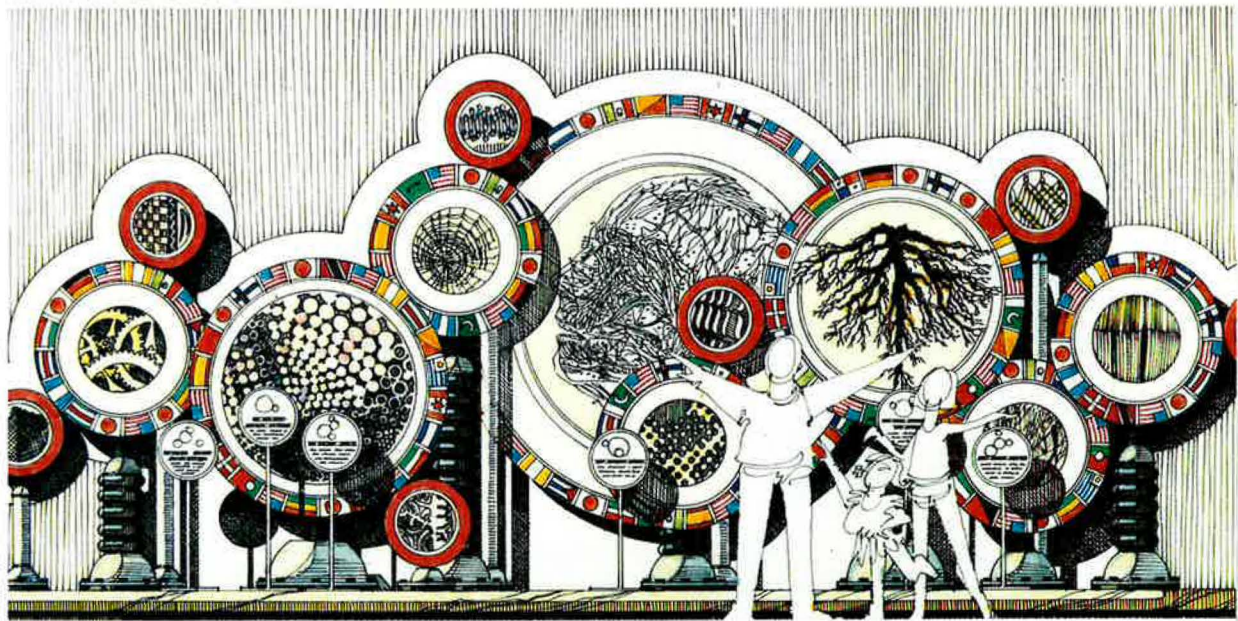
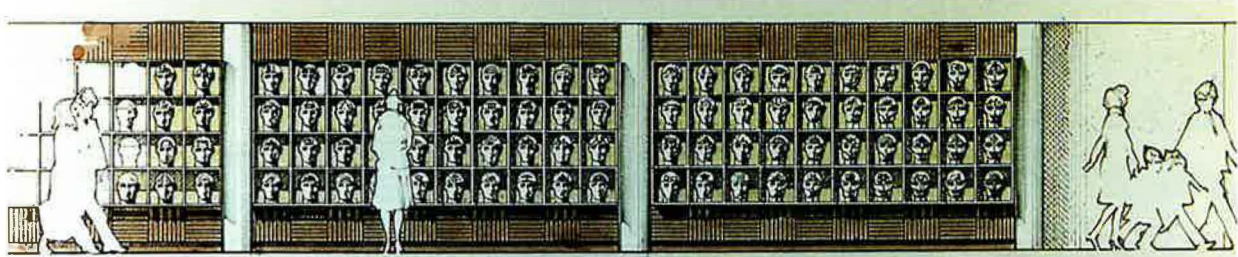
On October 11, 1983, the United States became the first country to sign a formal international participant agreement for Tsukuba Expo '85. The United States was represented at the signing ceremony in Japan by the Commissioner General of the U.S. Section, Ambassador James J. Needham.

The fact that the U.S. was the first official national participant was conspicuously noted by the Japanese Government and the media.

"We consider relations with the U.S. vital to us and we hope that bilateral relations will further progress in the future," said JAIET Chairman Toshiwo Doko. "This aspiration, I believe, is shared by all the Japanese people."

*The \$577,838 in funds that were surplus to Tsukuba participation needs were applied to other USIA exhibit activities, thus reducing the need for appropriations in later years.

5-7: Concepts became more tangible as exhibit designs evolved. The following illustrations were depictions of the Preamble, Mind Machine and Networking exhibits within the U.S. Theme Pavilion.







The Pavilion

The U.S. Pavilion covered 32,293 square feet on a 53,821-square-foot plot at the northwestern corner of the Expo grounds, and consisted of two courtyards, two plazas and three separate buildings: Theme Pavilion, Theater and Corporate Pavilion. The larger and higher Theme Pavilion to the right and the somewhat lower Corporate Pavilion to the left, were both housed under cable-tensioned polymer fabric roofs. Between them was the trapezoidal Theater, where "To Think," a 15-minute film, was shown.

While there were arrays of other competitive technological fields to choose from as the Pavilion theme, artificial intelligence was at the cutting-edge of science and technology. Moreover, the U.S., more than any other country, was substantially ahead in its research. So, virtually from the beginning, the theme

of "Artificial Intelligence: Amplifying the Mind" was the obvious choice for the U.S. Pavilion. What was important about artificial intelligence as a theme was that it provided an outlet to illustrate America's involvement in technological hardware. Whether or not machines can indeed be made to "think," the question raised a host of social, moral, philosophical and cultural issues.

A computer with some functions similar to those of the human brain and software with some characteristics of the human mind gave a reasonable segue from the mind of man to artificial intelligence. In America, the innovations in the area were evident through the transfer from automatic intelligence systems to synthetic creative intelligence. These systems could be represented by programs of perception, inference, language, robotics and expert systems; the story would become more credible if their applications were illustrated through use in medicine, business and manufacturing, econometrics, education and space. The official synopsis for Tsukuba Expo '85, prepared on March 3, 1983, noted that artificial intelligence, with the global web of communications systems as its prerequisite, was the "U.S. response to the Expo '85 challenge."

Artificial intelligence, when proposed as the U.S. Pavilion theme, triggered interest both inside and outside USIA. Yet, many did not know what exactly artificial intelligence was. On April 25, 1983, USIA, with the cooperation of the Woodrow Wilson International Center for Scholars, sponsored a conference that gathered more than 60 distinguished representatives from the U.S. artificial intelligence community who defined artificial intelligence as a science and technology and probed how artificial intelligence could better human life.

The results of the Wilson Center Conference were manifold. It confirmed that artificial intelligence, with its revolutionary potential, was at the forefront of technology and was a field developed almost exclusively in the United States during the last 25 years. As the U.S. national exhibition theme at the Expo, it would demonstrate an aspect of American genius that addressed not only scientific progress but also ethical and political issues. Above all, the conference brought artificial intelligence to public attention, enhancing a consciousness of the Tsukuba project.



9: *This architectural model shows in the background the three buildings of the U.S. Pavilion. The foreground structures were for other participants.*

The Wilson Center Conference, plus consultations with the Department of Defense and its Defense Advanced Research Projects Agency, the Department of Commerce, the National Science Foundation, National Aeronautics and Space Administration and the White House Office of Science and Technology Policy, opened up roads into America's artificial intelligence community for the Tsukuba staff to investigate. The objectives of these contacts were both advisory and catalytic. They led the Tsukuba staff toward a more tangible theme and exhibit content. The contacts were expansive, reflecting the mobility of American scientists between academia, corporations, small entrepreneurial enterprises and government.

Early in 1984, the Tsukuba project team started looking for what it described as "the real stuff"—demonstrable and functional systems that illustrate what artificial intelligence is about and whose owners were willing to lease, loan or donate the systems as contributions to the U.S. national exhibition. What they encountered were a host of reasons why organizations could not take part in the U.S. exhibit. Much of their latest technology was still in the laboratories and so exotic as to be incomprehensible to laymen. Systems that seemed more appropriate would be extravagantly expensive to make demonstrable. Some corporations hesitated to reveal their latest research. World expositions, they added, were hardly tools to use to market hardware and software. At the root of all such problems was the fact that the artificial intelligence industry was still very young. Most companies were small and resources low, allowing no extras.

Despite these barriers, the Tsukuba project team managed to collect a wide assortment of "live" equipment to fill the Pavilion's demonstration area. Nearly all the equipment was shipped from the

U.S. and arrived in Japan mostly in February 1985. Technicians arrived en masse in late February and the final push was made to complete installation. Last-minute changes in the electrical systems and other modifications were made to accommodate some of the equipment, and by March 10, one week before the official opening of the fair, most systems were up and running.

A filmmaker was selected to produce the U.S. Pavilion Theater's 70-millimeter, 15-minute film, "To Think," to be shown in the 400-seat theater. "To Think," after a series of late changes, was screened for the first time just two days before the opening of the fair.

For the first time in an international exposition, space in a U.S. Pavilion complex was leased for private industry's use to develop, install and operate independent exhibits that adhered to the Expo theme. The corporations were selected on a first-come first-served basis, on the condition that they also be contributors to the national exhibit in the adjacent main U.S. Theme Pavilion.

The corporate participation was based on the premises that it would save exhibit fabrication costs, produce revenue and expand the U.S. presence at Tsukuba; it also provided U.S. corporations with an opportunity to have a prominent presence at the Expo which otherwise might not have been possible. The result was a successful and popular private-enterprise Pavilion, with more than 2 million visitors during the fair.

In addition to the success of the private sector Pavilion solicitation, corporate solicitation efforts for donations in-kind and in cash yielded travel support and air tickets, followed by an array of cash, services and goods.



10: The AI Conference at the Wilson Center provided a catalyst to the U.S. theme development.





The Exhibition

The entrance to the U.S. Pavilion complex was made up of greatly enlarged replicas of computer and other electronic components, sculptured into a tapered tower. At night, it was illuminated, symbolizing America's sharing of knowledge and technological progress with the world.

Inside, visitors entered into a hall lined by pressure-molded transparent plastic masks, with tiny lights blinking on and off in a travelling wave. An audio tape ran continuously as they walked through the corridor. "Man will never fly," a voice challenged; the sound of a Boeing 747 taking off followed. "Talking across great

distance can't be done," another voice said; then a person was heard making an overseas telephone call. Electric light, television, man on the moon—various voices introduced other challenges to human ingenuity that once seemed impossible, until they led to the inevitable question: "Can man create a machine that thinks?"

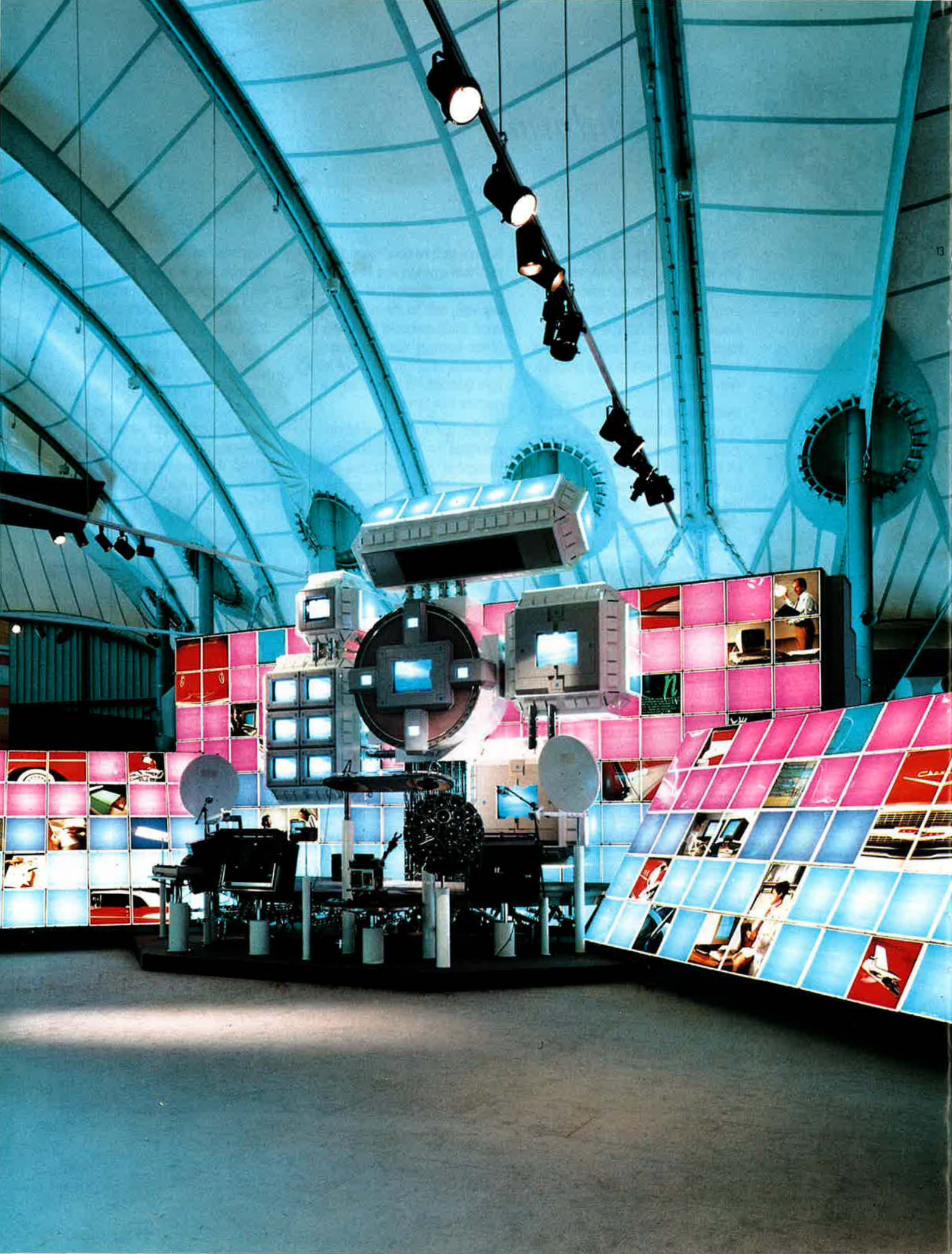
The first half of the U.S. exhibition delineated the "Road to Artificial Intelligence." Here guides met visitors and described displays tracing the history of computer research. An *information rail*, a series of foot-wide counters running in front of the exhibits,

elaborated on this history. A mammoth electrical plug, a giant transparent case filled with wires, and a mirrored panel lined with rows of vacuum tubes were exhibits that represented the first computers.

"The earliest computers were slow, inefficient giants," the guides explained, referring to the five-ton IBM Mark I built in 1944, "with 500 miles of wire and nearly one million components. At the University of Pennsylvania in 1946, ENIAC, the first entirely electronic computer was invented. It was as big as a house, used 19,000 vacuum tubes, and so much electricity that its parts burned up, causing frequent breakdowns."



12: "Can man create a machine that thinks?" asked one of the voices in the Preamble.



13: *The Mind Machine* combined sophisticated audio-visual techniques with a live theatrical presentation to portray artificially intelligent computers of the future.

14: *The Road to AI* used a mammoth electrical plug, a wire maze and hundreds of vacuum tubes to represent the bulkiness of early computers.



The second part of "Road to AI" featured a giant transistor and the first integrated circuit. The latter, the actual first chip ever produced, had been personally installed in the Pavilion for the fair's opening by its inventor, Jack Kilby. Across the platform, two video monitors continuously ran a two-minute video program that reinforced the historical message.

Visitors then passed into a semicircular exhibit, "Networking." Panels of graphics and text compared natural and synthetic networks—for example, chips to neurons and computers to groups of people. A video program described the symbiotic relationship between computer networks and artificial intelligence. A full-

scale model of the Tracking and Data Relay Satellite, suspended from the ceiling, illustrated the importance of space in worldwide information networks.

Further on lay the "Free Flow of Information" exhibit. Visitors saw a series of gear-like wheels, with national flags painted on their circumference to illustrate that networks depend on interactive parts; they function properly only if the global flow of information is unimpeded.

A computer terminal and a printer provided access to information data bases, from up-to-the-minute news, weather, sports and stock market data to research on esoteric subjects. Next to it stood a telephone with a display screen and a complex switching facility. The latter was actually the heart of the

Pavilion's internal communications network as well as its link to the rest of the world. The entire telephone system was custom built and installed especially for the U.S. participation at Tsukuba. A video program outlined the benefits of liberally flowing global information.

A giant panel across from the "Free Flow of Information" exhibit was divided into 133 illuminated squares, each carrying the name of an American Nobel Prize winner in the realm of science. Touch-sensitive screens enabled visitors to access the scientists' biographical sketches.

15: Gear-like wheels in Free Flow of Information symbolized the need for free access to information in order to maintain a global network of communications.

16: George Segal's Man and the Computer, featured on the 1982 'Man of the Year' Time magazine cover, illustrated that the computer had finally come of age.

17: Replicas of electronic components made up the colorfully illuminated Light Fountain.



From the "Nobel Laureates," the path widened into an open area. Against the right wall sat a sculptured man and woman in a living room setting. The familiar work by George Segal was commissioned by *Time* magazine and featured on its 1982 Man of the Year cover. In the Pavilion, it symbolized that the computer had come of age.

A "Children's Workshop" consisted of an array of paraphernalia that demonstrated the enormous capabilities of a child's mind. Association, intuition, common sense, memory, analogies, guesswork—a variety of mental capabilities are used when children solve problems, and if machines were to think they should use them too. Two video monitors played a program on this subject. Game posts depicting these capabilities ranged from mazes and puzzles to building blocks.

The "Mind Machine" facing the "Children's Workshop" was not an actual machine, but a representation of a reasoning computer. A large futuristic stage with a backdrop of techno-gadgetries such as blinking lights and monitors stood framed between two wings of illuminated slide panels. The "Mind Machine" exhibit itself was an interactive audiovisual presentation. A guide served as host and the "Mind Machine" as the backdrop, was the guide's "smart-aleck" expert-system companion, specializing in automotive repairs. Through a dialogue with the "Mind Machine," the guide found the answer to the car trouble but also tried to offer the audience insight into a paradox—"the 'Mind Machine' knows everything about automobiles, its expert field, but nothing about anything else."

Between each 15-minute "Mind Machine" presentation, visitors were entertained by a series of video shows including some of the most exciting work of American computer graphic artists.

18: The world's first integrated circuit was a popular attraction.

19: Youngsters at the Children's Workshop offered poignant Pavilion scenes for broadcasting.

20: The Road to AI presented a history of computer research.

21: The Mind Machine show delighted audiences.

The second half of the U.S. national exhibit, the systems demonstrations area, where visitors saw artificial intelligence in application, was called the AI Lab. Video monitors continuously showed a 30 minute documentary elaborating on the work of one of America's leading artificial intelligence research groups.

In the AI Lab, visitors' attention was first caught by giant images of the crowd gathered in front of the platform projected on a large screen. A guide working on a Paint & Draw computer program framed images of approaching crowds, then using a mouse as a "paint-brush," added beards to faces, altered dress styles and colors, changed heads of one person to torsos of another and made shaggy mops of hair smooth or completely bald.

Other computers were programmed to compose and perform Baroque music, to solve the Rubik's cube puzzle, to understand the manipulation of children's building blocks, and even to analyze the Japanese game of *go*.

Next was a music composition program. Its selections ranged from short and upbeat jazz pieces to microtonal and statistically-based tunes. This was followed by the Molecular Modeling program, operating on a graphics terminal with a keyboard and variety of knobs that portrayed molecular models on the screen and permitted them to react with one another without expensive laboratory experiments.

Across from the Molecular Modeling system was a robot arm with a high-resolution camera. The system selected and mounted puzzle pieces on white plastic disks that transformed into coasters for giveaways. Four pieces made up each pie-shaped puzzle, and when the camera "saw" the arm picking up a wrong or inferior part, it directed the arm to throw the piece away.





22: *AI experts were impressed by the AI Lab's range of systems.*

23: *The TI Voice Command demonstration produced multi-colored posters in response to verbal commands.*

24: *The Symbolics' "Paint and Draw" demonstration drew laughter as visitors saw video images of themselves altered by digital imaging techniques.*

For the first three months of the fair, another robot arm and camera system were demonstrated. This system sorted gears running through a conveyor belt.

A digital image processor was another vision system on the AI Lab platform. A visual tape shown on its two monitors explained how artificially enhanced images are today integral in fields such as medicine, weather forecasting and architectural restoration.

Across from the image processor, visitors were treated to a demonstration of a Voice Command System. The demonstration, which involved volunteers from the audience to help color in a picture on the screen, illustrates how computers can respond to spoken commands, obviating the need for keyboard input.

A reading machine, as did the Voice Command System, provided a popular demonstration because it offered instant feedback. By slipping hardcopy English text under the cover of this photocopier-like unit, a guide showed how it read aloud for people who could not see.



In addition, another machine showed visitors how computers phonetically read sentences and paragraphs typed into the machine.

A medical system nicknamed "Puff" occupied a corner on the central AI Lab platform. This Pulmonary Function Test system enables doctors to get an on-the-spot analysis of the condition of a patient's lungs.

Also displayed on the AI Lab platform was the backpack Space Shuttle crew members shouldered to fly around the orbiting ship. A mock astronaut carrying this unit stood next to "Puff," providing one of the most popular locations for visitors' souvenir snapshots. A model of a space station was suspended from the ceiling, and its accompanying text described future environment in space that will rely on artificial intelligence to maintain life and to provide the research



25: The robot-arm used a video vision system to correctly select and assemble pieces into decorative coasters which were given to visitors.

26: The U.S. Pavilion Theater capacity, strictly regulated by Japanese building codes, was 400.

base for scientific endeavor in space. Nearby, a film was shown on a large 45-inch television monitor, and another large screen showed algebraic to algorithmic computations. This computer-mathematician illustrated how computers are used today in advanced mathematics.

Close to the Pavilion exit, a mechanical-looking plotter attracted visitors to observe "Aaron," the Pavilion's artificially



intelligent "artist" programmed to produce original abstract pen and ink drawings. One of the most popular exhibits in the Pavilion, it aptly provided the key to the Pavilion theme.

"Aaron knows a few rules on how humans see and draw," guides explained. "It knows the rules of perspective, for example. Aaron, like a child, never draws the same drawing twice—and what is amazing about it is that no one can tell what it will draw just as no one can tell what a human artist might draw next."

"To Think" was a 15-minute 70-millimeter color motion picture dramatizing in four scenes a fable set in the future. It told the story of a companionship between a young boy, who subsequently grew into manhood as a surgeon, then as an old man, and a life-long presence of machine-intelligence.

The intelligence teaches the boy a scissors-and-rock game in the first scene, revealing the tutorial role it plays to its companion as a child. When the child becomes a young doctor in the second

scene, the intelligence becomes his aide that helps him find a solution to a surgical question for which he needs inspirational input. By the third scene, the boy has grown into an old man, reliving from a couch the memories of his past. The machine-intelligence that had been his friend over life helps him cull through his memory and displays for him scenes of the man with his son in his youthful vigor.

The final scene focuses in on a little girl named Allison, in a setting similar to that of the first. She teaches the machine-intelligence her version of the scissors-and-rock game—a scene that symbolizes how machine-intelligence can transmit wisdom and achievements to future generations as well as learn from human beings.

"To Think" was a metaphorical effort to project the vision of how someday people will interact with artificial intelligence to enhance their lives.



Corporate Participation



27: DuPont hostesses introduced visitors to a cockpit that took them on simulated human-powered flights.

28: Texas Instruments provided a multi-media presentation on the development of the integrated circuit.

29: Polaroid's exhibit theme emphasized photography as a tool for a facet of artificial intelligence—memory.

30: Pick-up receivers in TRW's booth gave facts and figures on the various communications satellites depicted on the walls.

The U.S. Corporate Pavilion housed displays from four major American companies.

Over 3,800 square feet of the U.S. Section's Pavilion was set aside for use by American corporations or their Japanese subsidiary corporations to install exhibits related to the U.S. Pavilion theme. There was a charge for use of the space on a square foot basis and a contribution to the U.S. theme pavilion was a prerequisite for selection. An application form was sent to interested companies, requiring a deposit when submitted. Selections were based on the order in which applications were received. The deposit was refunded if companies were not selected or kept, as a security deposit until the end of the fair, if selected and a formal participation agreement was executed.

The corporate section was divided into modules of different sizes, with a cost fixed to each module. Following are statistics related to the corporate participation:

1. Texas Instruments Japan, Ltd.; December 24, 1984; 2 modules, 1,238 square feet; \$84,184.
2. DuPont Japan, Ltd.; Jan. 25, 1985; 1 module, 619 square feet; \$42,092.
3. Polaroid Corp. of Japan; Jan. 25, 1985; 3 modules; 1,329 square feet; \$90,370.
4. TRW, Inc.; Jan 29, 1985; 1 module; 630 square feet; \$42,417.

TOTAL: \$259,063.

The Polaroid exhibit invited visitors to a 42-projector multi-media program tracing the history of instant imaging from the invention of instant photography to the latest developments in electronic and magnetic imaging systems. Memory is integral to artificial intelligence, and



photography is one way to maintain memory. In addition, Polaroid's life-size hologram attracted visitors' attention to the largest computer graphic hologram ever produced in the world. The three-dimensional image represented an "electronic" anatomy of the human brain, produced by digitizing visual information from a number of different sources—including Leonardo da Vinci's notebooks.

Visitors approaching the DuPont exhibit saw a unique white egg-shaped dome. Inside, it visualized on a Vista screen the sky and a panoramic view of the Grand Canyon. Guests were invited to sit in one of the three cockpits simulating that of Gossamer Albatross, the first human-powered flight vehicle that crossed the English channel. As the "pilot" pedaled away, the cockpit rose by oil pressure, giving the impression of flying. A boarding ticket kept track of the amount of manpower exerted and punched out the height and distance he may have flown if on the real flight machine. DuPont's exhibit emphasized its commitment to the advancement of artificial intelligence through the science of aeronautics.

An audiovisual presentation in the mini-theater booth was Texas Instruments' "Innovation—The IC World." Outside, TI hostesses handed out pamphlets embedded with actual integrated circuit chips. Inside, the show reinforced the Theme Pavilion's "Road to AI" exhibit.

The history of the integrated circuit, with so much capacity for memory, is based on the challenge of the micron, and even, submicron world. It also revealed the catalyst role of TI in the development of these tiny chips at the core of electronics today. This multi-media presentation won a gold award at the Annual International Film and Television Festival held in New York in November 1985.

Visitors strolling in the TRW semicircular exhibit area saw mural displays of state-of-the-art developments, from mundane products to space technology. By-products in telecommunications research lead to enhancements in everyday products—belt buckles, buttons and air bags that ward off shocks in car crashes. They also lead to exciting developments such as digital steering, which enables drivers to doze off as automobiles intelligently drive to preset destinations. Voices from the pick-up receivers installed in the area told visitors various facts and figures on satellites depicted on the walls. They referred in detail to TRW's 570-pound Tracking and Data Relay Satellite, vital in space communications and simultaneously on display as a model in the Theme Pavilion.

Operations



The U.S. Pavilion Restaurant was reported to have been the most successful commercial venture at Tsukuba Expo '85. The income earned by USIA through this venture was \$72,764 from a percentage of \$2,910,522 in gross sales, plus \$291,000 remitted initially by the operator for rights to the U.S. Pavilion Restaurant.

The operator of the U.S. Gift and Refreshment Shops in the Pavilion garden courtyard had gross sales of \$1,168,694; USIA's share through the Gift Shops and Refreshment Shops totaled \$26,048. This was in addition to upfront cash payment of \$8,000.

(All dollar figures calculated at the rate of Y230 to a dollar.)







Public and Press Response

31: Japanese Prime Minister Nakasone and Mrs. Nakasone watch with interest as the U.S. Pavilion robot artist "Aaron" performs with explanation in Japanese by Pavilion staff member.

32: His Majesty, the Emperor of Japan, displayed keen interest in the U.S. Pavilion exhibits by making unscheduled stops for explanations during his tour. The official visit was prolonged by 12 minutes, a rare happening.

33: U.S. Information Agency Director Charles Z. Wick makes a pre-opening visit to the U.S. Pavilion.

The U.S. Pavilion recorded 4,819,904 visitors, one quarter of total Expo attendance. USIA contracted a public opinion company to conduct a visitor reaction survey, and over 1,000 Japanese visitors to the U.S. Pavilion were polled in the latter half of June. Contrary to premonitions that the theme's "avant-garde" nature would attract the technically-oriented sector of the public only, the results indicated high overall popularity, particularly among those in professional and managerial occupations generally representative of Japanese opinion leaders in science, government, business and academia. Of all the survey respondents, 36 percent evaluated the U.S. Pavilion positively; 40 percent rated it fair; and 16 percent checked it off as poor.

In an open-ended response, 13 percent of those polled answered that seeing the "latest computer technology" systems was what they liked most about the Pavilion. Eleven percent specified the computer "artist" Aaron, and nine percent the "Road to AI." The Manned Maneuvering Unit and space station were cited as favorites by five percent; the robot arm and vision system, audio systems, the Pavilion film and guide attitude each shared four percent; music composition systems and "Children's Workshop" were each most liked by three percent of the pollees. In addition, two percent noted that the Pavilion atmosphere and appearance caught their eyes the most.

The 38 bilingual U.S. Pavilion guides shouldered a special role at Tsukuba Expo '85. Not only did they play hosts and hostesses to the hundreds of visitors, but they also acted as a bridge between languages, filling the gap between cultures. What was more, they served as buffers between the state-of-the-art technology and the general public. How they appeared to the general audience was critical to the success of the U.S. national exhibit.

Despite the weight of their role plus their 12-hour workdays, the guides elicited a highly positive reaction. The public was clearly impressed. Letters poured in, some addressed to individual guides. Many said their meetings with the young, friendly Americans who spoke Japanese were the high point of their visit to the fair. Others sent photographs taken at the Pavilion, with postscripts thanking them for their patient explanations. A few guides even started getting steady fan mail.

The dynamic array of special visitors who crossed the U.S. Pavilion threshold was impressive. It began with a pre-opening visit by U.S. Information Agency



34: Ambassador Vernon Walters, the permanent U.S. representative to the United Nations, was impressed with the idea of computers being able to compose music.

35: Fifty-five leaders from People's Republic of China including its Minister of Foreign Affairs toured the exhibit with a Chinese-speaking U.S. Pavilion Guide.

36: Their Majesties, the King and Queen of Nepal, tour the U.S. Pavilion.



Director Charles Z. Wick and by closing day, Japanese Prime Minister Yasuhiro Nakasone, the entire Japanese Cabinet and Diet, several heads of state, U.S. Congressmen, and legions of academic, business and political leaders from all corners of the world—from Fiji to Sweden—had come to see what the U.S. Pavilion had to offer. On average, the U.S. Pavilion handled 30 to 40 VIP visitors each day.

The peak in the schedule came with the Emperor's visit, a historic occasion, on June 26. To the delight of the Pavilion hosts—though somewhat to the dismay of his entourage—the Emperor stopped and asked numerous questions, considerably overstaying the meticulously pre-planned time allotted for the visit. As the waiting vehicle whisked the

84-year-old Emperor away to his next stop, an accompanying Japanese security member told a U.S. Pavilion staffer that the visit was the Emperor's longest at the fair site. "It's a sign that His Majesty was extremely pleased," he added.

The U.S. Pavilion was one of the most popular international pavilions for both domestic and foreign media coverage during the fair. Milton Moskowitz, in the

37. Princess Chichibu tells a voice recognition computer what colors to paint a picture.

38. Prince and Princess Hitachi tour the U.S. Pavilion.



May 27, 1985, issue of the *San Francisco Chronicle*, wrote:

"Most of the national exhibits here (at Tsukuba Expo '85) are pallid....On the other hand, the United States Pavilion...won high marks from most observers....It has as its theme, Artificial Intelligence: Amplifying the Mind; a raft of computers are programmed to carry out a wonderful variety of tasks, such as composing music,...creating original art....It has just the right touch: high tech crossed with a sense of humor."

Interest was strongest among Japanese media; the result was frequent U.S. Pavilion event coverage in Japan's four main nationwide dailies—*Asahi Shimbun*, *Yomiuri Shimbun*, *Mainichi Shimbun* and *Nihon Keizai Shimbun*. The NHK, Japan's national television network, featured different exhibits in their news, science and Expo specials. Asahi and TBS broadcasting, among private Japanese broadcasters, highlighted U.S. Pavilion demonstrations; the latter, which had a studio set up jointly with a Canadian broadcasting station in the Canadian Pavilion, regularly aired sketches of U.S. Pavilion guides on its daily special, *Expo Scramble*. Japanese industrial dailies as well as science and technology journals—*Computopia*, for example—printed feature articles on the U.S. Pavilion theme. In addition, local newspapers such as *Ibaraki Shimbun* and *Joban Shimbun* were always on hand to cover festivities and visits, in particular the July Fourth celebrations and Pavilion tours by members of the Imperial Household.

39. Dr. D. Baranov, Vice-President of the USSR Chamber of Commerce and Industry, visits the U.S. Pavilion.

40: Canadian Minister of Transport, Donald M. Mazankowski, is greeted by U.S. Pavilion officials in the Commissioner General's Lounge.

The Washington Post, Seattle Times, USA Today, Denver Post, Newsweek, Time, Forbes and The New Yorker were among the American publications that covered the U.S. Pavilion in one way or another. CBS, NBC and PBS taped several Pavilion demonstrations for broadcast.

The media gave ample attention to write-ups on guides and their ability to speak Japanese.

"I admit to a sense of nationalistic pride in the United States pavilion, staffed by Japanese-speaking Americans. For example, Lena Marshall of San Francisco was holding forth the day I attended, explaining the progression of computer technology from the first ENIAC installation in 1944 to present-day miniaturization. I asked the Japanese friend who accompanied me to Tsukuba how good Marshall's Japanese was. 'Absolutely perfect,' he said. If Marshall can do it—three years of study including one year in Tokyo—why not American businessmen?" wrote Hobart Rowen in his *Washington Post* (June 30, 1985) column.

In a *Yomiuri Shimbun* (June 12, 1985, evening edition) article, in the "Enhancement of Music" series, Mieko Sakai wrote that her sole objective in visiting the fair, full of international and corporate pavilions, was "the music composition system at the U.S. Pavilion."

Mainichi Shimbun (June 11, 1985, evening edition) featured Aaron in an article devoted to "U.S. Pavilion: Computers as Artists," describing it as a system that thinks while drawing and therefore never draws the same work twice. "During the six months, it will draw approximately 7,000 drawings. No one will deny that it is the most productive artist in the world."



Detroit News' Joel J. Smith, in "Robots Dominate Frontier of the Future," which appeared in *The Seattle Times* (June 4, 1985), rated the U.S. Pavilion as the second most popular exhibit. He wrote, "More than one million people, or one of every three visitors, have visited the U.S. exhibit since it opened March 17. Among other things, visitors get to see the artificial intelligence machines capable of rational thinking. There's a robot that tackles the challenge of putting together a scrambled puzzle. After analyzing each piece, the robot puts together the puzzle parts, somehow knowing exactly where each piece goes."

San Francisco Examiner Sunday travel section (June 30, 1985) picked as its favorite exhibits the Paint & Brush program and that which composes and rearranges Baroque tunes. "The United States Pavilion here is one of the best of the international exhibits. It keys in directly to the Expo theme, focusing on artificial intelligence and showcasing the 133 Americans who have won Nobel prizes."





Special Events

Five companies of dancers and musicians gave a total of twenty performances to commemorate U.S. National Week at Expo, July 1-5. Five of those performances, plus a ceremony at which U.S. Ambassador Michael J. Mansfield was the guest of honor, a VIP luncheon hosted by JAIET, a reception at the U.S. Pavilion for approximately 1,000 guests, and an evening gathering off-site for U.S. Pavilion staff with staff from other pavilions as guests marked July 4, designated Expo's official U.S. National Day.

Over 25,000 visitors to Expo that week are estimated to have seen at least part of one of the events, which covered a wide range of American arts. While on a USIA-sponsored tour of East Asia, the Bella Lewitzky Dance Company of Los Angeles, one of this country's most innovative modern dance ensembles, performed before full houses throughout the week at the 550-seat Expo Hall. The University of Hawaii's Maile Aloha

Singers sang and danced to traditional Hawaiian and popular American music at Expo Plaza, JAIET's 3000-seat amphitheater. On July 3 the pace stepped up with the arrival of the Harvard-Radcliffe Orchestra, which gave two pops concerts and a children's concert at Expo Plaza as well as an off-the-site goodwill performance. On the Fourth, bandleader Frederick Fennell came to Expo Plaza and led the Tokyo Kosei Wind Orchestra in a "Cavalcade of Popular Music in the USA." Finally, on Friday afternoon an all-American girls' drill team, Miss Drill Team USA, performed at Expo Plaza. In addition to these live events, a specially-made 20-minute video on the United States produced by USIA's television and Film Service was shown on Expo Plaza's giant screen and on the gargantuan 82-foot by 131-foot outdoor JumboTRON screen—equivalent to 10,000 20-inch TV screens—as part of the JAIET series of programs, "This is My Country."

While National Week was certainly the highlight of the Pavilion's events calendar, it was only one of ten programs that took place over the course of the fair. Four of these additional events were in the entertainment category and five were scholarly in nature. The biggest of the other performing events was the appearance at Expo Hall by the Tennessee Children's Dance Ensemble, a troupe of 22 young professional modern dancers from Knoxville, aged 8 to 17,



41. U.S. Ambassador Michael J. Mansfield officially opens U.S. National Week at Expo '85.



42: USIA's Arts America sponsored the innovative Lewitzky Dance Company's five-nation tour of the Far East.

43: The U.S. Pavilion was transformed overnight for the official July Fourth reception, dominated by a mammoth "birthday" cake.

44: Expo '85 Commissioner General Katsuichi Ikawa paid tribute to the U.S. Pavilion exhibits, which he said well represented the achievements of America's creative spirit and free institutions.

45: Ambassador Mansfield, as honored guest at the U.S. Pavilion National Day Celebration, along with Ambassador Needham and other senior officials and spouses, greeted hundreds of guests invited to a reception in the Pavilion.



who delighted standing-room audiences at Expo Hall on the fair's penultimate weekend, September 7 and 8. In May and September, the Pavilion was able to put on performances by two visiting amateur groups of cloggers, both from Utah, who danced on the plaza just outside the Pavilion. Also in May, the Pavilion sponsored four concerts at Expo Plaza by the U.S. Air Force Band of the Pacific.

The Pavilion's most significant program of an academic nature was the U.S.-Japan Cooperative Seminar on Knowledge Systems in June, which was cosponsored and organized by the National Science Foundation and the Japan Society for the Promotion of Science. This four-day event, which opened at the Tsukuba Expo Center with a welcoming speech by the U.S. Pavilion Director, brought together 20 leading artificial intelligence experts. Following a buffet luncheon in the U.S. Pavilion's VIP Lounge and a tour of the American exhibit, the participants—who included, on the American side, Stanford University's John McCarthy, the inventor of the term "artificial intelligence"—left for Numazu, south of Tokyo, for two more days of intensive discussions. A concluding press conference was held in Tsukuba on the fourth day.

Another event of major intellectual significance that enhanced the credibility



of the U.S. Pavilion in the Japanese AI community was the program organized for Professor Lejaren Hiller of State University of New York at Buffalo, the creator of the Pavilion's AI music composition exhibit. Both a composer and a computer scientist, Professor Hiller made pre-arranged visits to both Tsukuba University and the Electrotechnical Laboratory of the Ministry of Trade and Industry, the two most important sites of Artificial Intelligence research in Tsukuba. On the last day of his three-day stay, the researchers he had met earlier came to the Pavilion to see a "creator's hands-on" demonstration of his music composition program.

The Pavilion cooperated in two additional seminars organized in Tsukuba by the United States Information Service, Tokyo. There were 26 high-level Japanese participants in the March International Communication Seminar "Free Flow of Information: U.S.-Japanese Approaches to Communication Problems and Opportunities," and 30 leading journalists from the northern Tohoku region took part in a June seminar entitled "Communications into the 21st Century: Are the New Technologies and Democratic Society Compatible?" Finally, with the help of USIS Tokyo and USIA Washington, the Pavilion was able to present speakers from the United States at the JAIET-organized "Science City" symposium in Kyoto in June.

The U.S. Pavilion brochure, *Artificial Intelligence: Amplifying the Mind*, was a 16-page four-color booklet focusing on the American success in the development of artificial intelligence. An article by a *Fortune* editor Tom Alexander probed into the possibilities of artificial intelligence in "Inventing Artificial Intelligence"; others, by an Agency writer, were entitled "The Evolution of the Thinking Machine" and "The Intelligent Environment." All editorial and graphic work was done by the Agency's Press and Publications Service.

A Tokyo-based firm was able to produce, with Agency cooperation and partial sponsorship by the Intel Corporation, a total of 200,000 copies. In addition to the brochure, the Pavilion was supplied with limited copies of *Knowledge Systems: Possibilities and Implications*. This bilingual report covered the edited transcript of the AI conference held jointly in April 1983 by the Wilson Center and USIA, and was printed with the cooperation of Houghton Mifflin Company and Dai Nippon Printing (America) Inc.

Hakuhodo, a Japanese advertising firm, also donated 5,000 copies of the *Nihon Keizai Shimbun* (Japan Economic Journal) advertising supplement on the U.S. Pavilion for mass distribution at the fair.



46. U.S. Pavilion guides.



Conclusion

World's fairs—large and small—have been given many descriptions, ranging from “Timekeepers of progress” to “idealized self-portraits.” They have been used by host nations to bolster national image, to rehabilitate local communities, and—not the least—to promote international cultural exchange and knowledge. To the participating nations, they have served also to underpin bilateral relations with host nations. Above all, they have told something about each contributing nation, something it wanted told.

The U.S. Exhibition at Tsukuba Expo '85 demonstrated something of all of these manifestations. Not perfect, it clearly was successful in adhering to the theme of the Fair. It took on one of science's most difficult and abstract challenges as its subject, and those concerned about the future of the mind and machines were impressed. It reached the unknown. Its hallmark was integrity.

Those who struggled with the concept—and those from government and the private sector who struggled no less with the operation of the exhibition—all deserve credit for their motivation, dedication, and downright hard work.



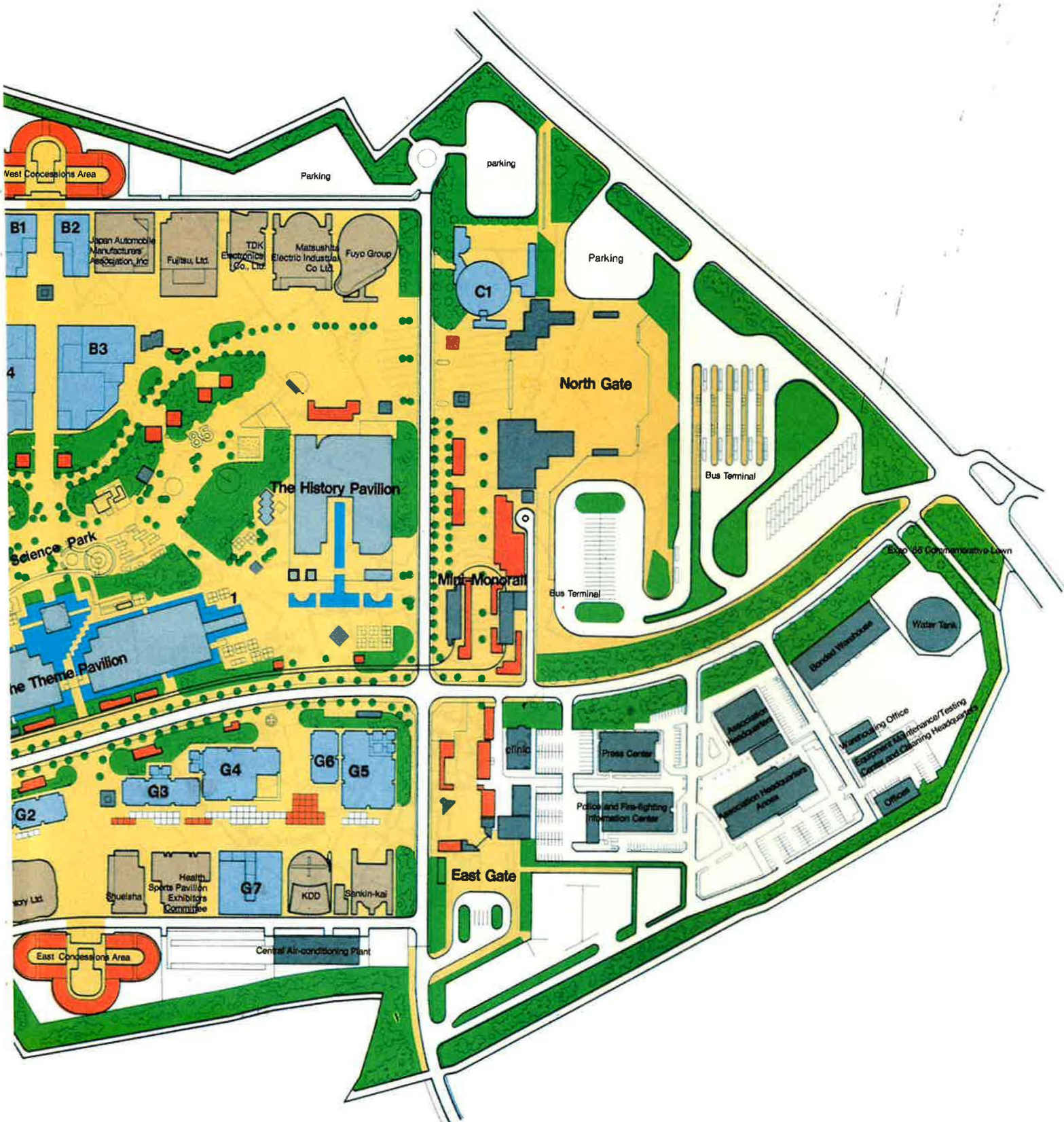
Foreign Government and International Pavilions

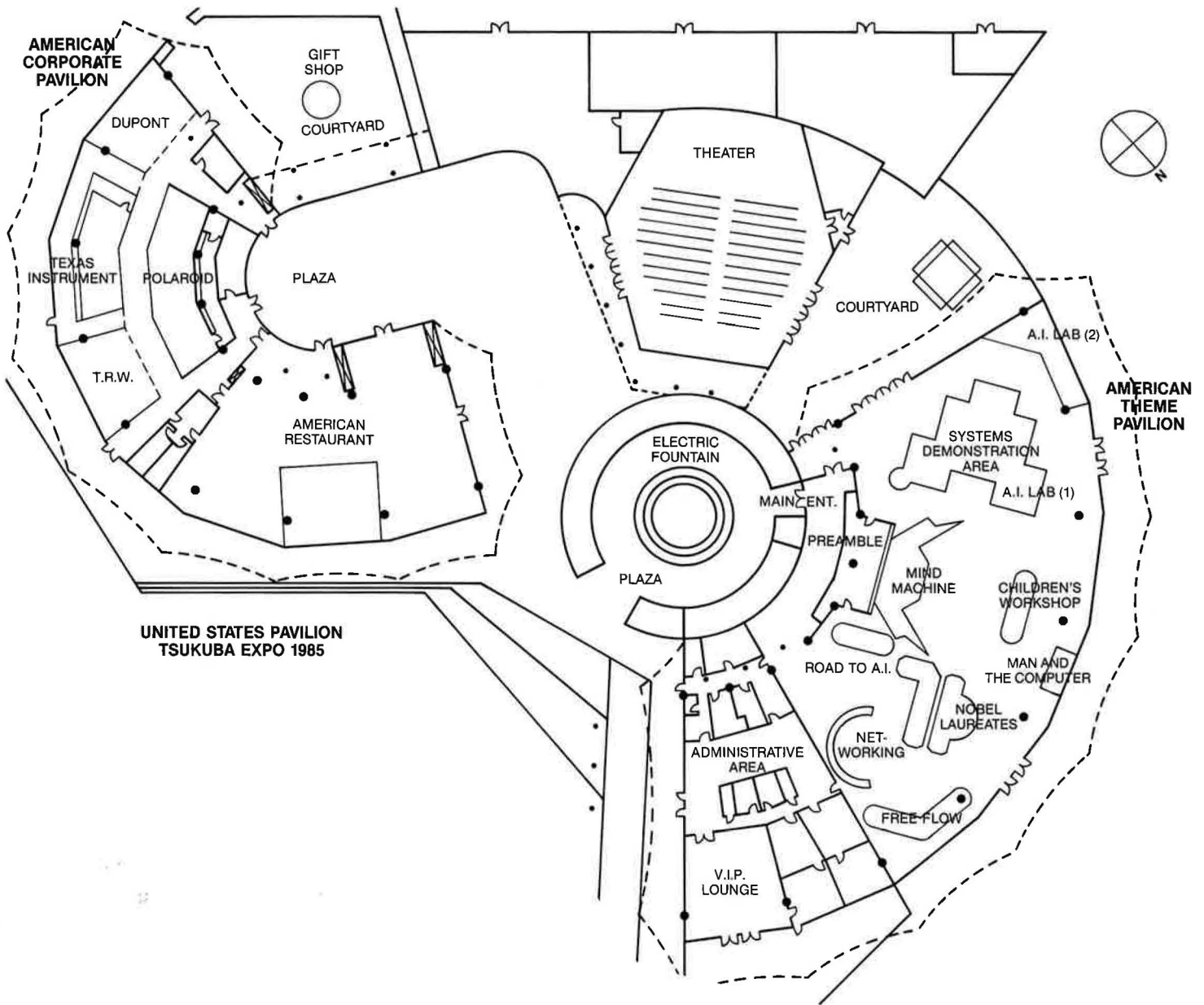
Japanese Government Pavilions

Service Facilities



Tsukuba Expo '85 Site Map





International and Corporate Participants

Foreign Countries

Australia *B3*
 Belgium *B4*
 Belize *A2*
 Brazil *A2*
 Brunei Darussalam *G3*
 Bulgaria *F2*
 Canada *G4*
 Costa Rica *A2*
 Dominican Republic *A3*
 Egypt *G7*
 Federal Republic of Germany *B4*
 Fiji *F3*
 France *B4*
 Indonesia *G2*
 Iran *G7*
 Italy *B4*
 Ivory Coast *F4*
 Jamaica *A3*
 Kenya *F4*
 Kiribati *F3*
 Nauru *F3*
 Nepal *A3*
 Panama *A3*
 Papua New Guinea *F3*
 People's Republic of China *G5*
 Philippines *G3*
 Portugal *A2*
 Republic of Korea *G1*
 Senegal *F4*
 Seychelles *G3*
 Solomon Islands *F3*
 Sri Lanka *G2*
 Sweden *B2*
 Switzerland *B3*
 Thailand *G3*
 Tonga *F3*
 Tunisia *G6*
 Turkey *G6*
 Tuvalu *F3*
 Union of Soviet Socialist Republics *F1*
 United Kingdom *B4*
 United States of America *A1*
 Uruguay *A2*
 Vanuatu *F3*
 Western Samoa *F3*
 Yugoslavia *B3*
 Zambia *F4*

International Organizations

Asian Development Bank *F4*
 European Community *B4*
 General Agreement on Tariffs and Trade *F5*

International Atomic Energy Agency *C1*
 International Civil Aviation Organization *C1*
 International Court of Justice *C1*
 International Fund for Agricultural Development *C1*
 International Labor Organization *C1*
 International Maritime Organization *C1*
 International Maritime Satellite Organization *G7*
 International Monetary Fund *C1*
 International Organization for Standardization *G7*
 International Telecommunication Satellite Organization *G7*
 International Telecommunications Union *G7*
 Organization for Economic Cooperation and Development *F4*
 United Nations *C1*
 United Nations Center for Human Settlements *C1*
 United Nations Children's Fund *C1*
 United Nations Conference on Trade and Development *C1*
 United Nations Development Program *C1*
 United Nations Educational, Scientific and Cultural Organization *C1*
 United Nations Environment Program *C1*
 United Nations Food and Agriculture Organization *C1*
 United Nations Fund for Population Activities *C1*
 United Nations High Commissioner for Refugees *C1*
 United Nations Industrial Development Organization *C1*
 United Nations Institute for Training and Research *C1*
 United Nations Relief and Works Agency for Palestine Refugees in the Near East *C1*
 United Nations University *C1*
 Universal Postal Union *C1*
 World Bank *C1*
 World Food Council *C1*
 World Food Program *C1*
 World Health Organization *C1*
 World Intellectual Property Organization *C1*
 World Meteorological Organization *C1*
 World Tourism Organization *F3*

Japanese Private Participants

Committee for Exhibition, Sankin-kai *H3*
 Dai-ichi Inc. *F7*
 Descote Ltd., Suzuken Co., Ltd., Otsuka Pharmaceutical Co., Ltd. *G12*
 Fujitsu Ltd. *B12*

Fuyo Group Exhibition Committee *B15*
 Hitachi Group Executive Committee *B9*
 IBM Japan, Ltd. *B9*
 Japan Automobile Manufacturers Association, Inc. *B11*
 Japan Gas Association *A9*
 Kodansha Publishing Co., Ltd. *B7*
 Kokusai Denshin Denwa Co., Ltd. *G13*
 Matsushita Electric Group *B14*
 Midori-kai (Sanwa Group) *G9*
 Mitsubishi Joint Committee *B8*
 Mitsui Group Exhibitors Committee *A7*
 NEC Corporation *G8*
 Nippon Telegraph and Telephone Corporation *B6*
 Shueisha Publishing Co., Ltd. *G11*
 Sony Corporation *D2*
 Sumitomo Committee *A8*
 Suntory Ltd. *G10*
 TDK Corporation *B13*
 Technocosmos Executive Committee *F6*
 The Federation of Electric Power Companies *F5*
 The Japan Iron & Steel Federation *B10*
 Toshiba Corporation *A6*
 UCC Ueshima Coffee Co., Ltd. *A10*

Japanese Government Exhibits

Children's Plaza *E3*
 Expo Plaza *D1*
 History Pavilion *E2*
 Ibaraki Prefecture *A4*
 Theme Pavilion *E1*
 Tsukuba Expo Center *CP*

Private Sector Support

Cash Donations

Amoco Japan Exploration Co.
 Anheuser Busch International Inc.
 Coca-Cola (Japan) Co., Ltd.
 International Business Machines Corp.
 Polaroid Corp. of Japan
 Texas Instruments Inc.
 TRW Inc.

In-kind Donations or Loans of Equipment

AT&T Bell Laboratories
Transistor Model
 Alcoa NEC Communications Corp.
Parabolic Receiving Dishes
 Anheuser-Busch International, Inc.
Beverages
 Artel Communications Corp.
Computer Peripherals
 Asakuma Co., Ltd.
Discounted Meals for Staff

A.T. Cross Export Co. <i>Pen Sets</i>	Hakuhodo Incorporated <i>Publications</i>	Oberheim Electronics, Inc. <i>Synthesizer Equipment</i>
Automation Intelligence, Inc. <i>Gear Sorting Robot</i>	Harrison Systems, Inc. <i>Mixing Board</i>	Oriental Kiiko Co., Ltd. <i>Guide Uniforms</i>
B-J Systems, Inc. <i>Puzzle-assembling Robot</i>	Heath Company <i>Robots</i>	Patco International <i>Socks for Guides</i>
James B. Beam Distilling Co. <i>Beverages</i>	Hilton International, Tokyo <i>Discounted Accommodations</i>	William Penn <i>Music Composition</i>
Bose KK <i>Speakers</i>	Honda Motor Co., Ltd. <i>Vehicles</i>	Polaroid Corp. of Japan <i>Cameras and Art Work</i>
Burroughs Co., Ltd. <i>Office Computers</i>	Houghton Mifflin Co. <i>Printing</i>	Price Waterhouse <i>Accounting Assistance</i>
CPC International <i>Food Products</i>	Hughes Aircraft Co. <i>Projector</i>	Proctor & Gamble <i>Hand and Laundry Soap</i>
Chewie Newgatt <i>Coffee Cups</i>	Jockey International, Inc. <i>Shirts</i>	Revlon K.K. <i>Soap</i>
Chrysler International S.A. <i>Vehicles</i>	Kellogg Japan <i>Food</i>	Rising Paper Co. <i>Paper</i>
Coca-Cola (Japan) Co., Ltd. <i>Beverages</i>	Kurzweil Music Systems, Inc. <i>Reading Machine</i>	Sea-Land Service, Inc. <i>Sea Shipping</i>
The Harold and Becky Cohen Corp. <i>Computer Art Display</i>	Lexicon, Inc. <i>Audio Equipment</i>	Sequential Circuits, Inc. <i>Synthesis Equipment</i>
The Computer Museum <i>Core Memory Model</i>	Martin Marietta Aerospace <i>MMU Model</i>	Simmons Japan Ltd. <i>Beds</i>
Control Systems <i>Multiport Host Adapters</i>	Max Factor K.K. <i>Makeup and Gift Items</i>	Sony Corp. of America <i>Laser Disc Players</i>
Dai Nippon Printing Co., Ltd. <i>Printing</i>	MediaSync, Inc. <i>Software</i>	Soundwave Inc. <i>Recorded Music for Film</i>
Digital Equipment Corp. <i>Vax 11/780 Computer</i>	Medical Graphics <i>Pulmonary Function Test System</i>	Spacegear Corp. <i>Reduced Cost for Spacesuit</i>
Walter E. Disney Enterprises <i>Design Assistance</i>	Micropro Japan Inc. <i>Computer Software</i>	State University of N.Y. (Buffalo) <i>Computer Music Composition</i>
The DuPont Experimental Station <i>Molecular Modeling Software</i>	Moog Music, Inc. <i>Audio Equipment</i>	Suntory Ltd. <i>Beverages</i>
DuPont Japan Ltd. <i>Carpeting</i>	Moridara Music Co. <i>Synthesis Equipment</i>	Symbolics, Inc. <i>3670 Computer; S-Paint; S-Geometry; Frame Grabber; Music Composition</i>
Elographics, Inc. <i>Touch Sensitive Screens</i>	Natural Selection, Ltd. <i>Plants for Pavilion Film</i>	3M/Optical Recording Project <i>Recording Equipment</i>
Evans and Sutherland <i>Graphics Terminal</i>	Neese Industries, Inc. <i>Raingear</i>	Texas Instruments Inc. <i>Office Computers; Voice Command System</i>
Ford Motor Co. (Japan) Ltd. <i>Vehicles</i>	Nihon Digital Equipment K.K. <i>Computer Equipment</i>	Toppan Printing Co., Ltd. <i>Printing</i>
Franklin Mint Co., Ltd. <i>Gift Vases and Masks</i>	Nihon Information Center of America, Inc. <i>Translation Services</i>	TRW Inc. <i>TDRS Satellite Model</i>
Fuji Xerox Co., Ltd. <i>Office Copiers</i>	Nippon Express <i>Truck & Float</i>	Tupperware International <i>Household Products</i>
General Electric <i>Television Projector</i>	Nippon Motorola Ltd. <i>Radio System</i>	UREI/JBL, Inc. <i>Audio Equipment</i>
General Motors Overseas Corp. <i>Vehicles</i>	Northern Telecom Inc. <i>Telephone System</i>	Varitel Video <i>Pre-mastering SIGGRAPH Disc</i>
Gould Corp. <i>Controller</i>	Northwest Airlines, Inc. <i>Air Travel</i>	Vicom Systems Inc. <i>Systems Equipment</i>
Grass Valley Group <i>Audiovisual Peripherals</i>	Nomura Display Co., Ltd. <i>Stage for Plaza Area</i>	View Engineering <i>Vision System</i>

Visage, Inc.
Video Equipment and Software

Volkswagen of America
Photo Slides

Western Union
Computer Terminal; Information Data Bases

Wilson Sporting Goods Co.
Sports Gift Items

Zippo Manufacturing Co.
Gift Lighters

Sponsorship

Anheuser Busch International, Inc.
Clydesdales; National Day

Arthur Andersen & Co.
"To Think" Movie

Asakuma Co., Ltd.
National Day

Association for Computing Machinery/
SIGGRAPH (ACM/SIGGRAPH)
Computer Graphic Show

Citibank/Citicorp
VIP Lounge; National Day

Coca-Cola (Japan) Co., Ltd.
National Day

Frederick Fennell
Musical Performances

Bernard A. Galler
Seminar Organization

Harvard-Radcliffe Orchestra
Musical Performances

Hawaii Visitors Bureau
Musical Performances

Intel Japan K.K.
Networking Exhibit

Japan Soc./Prom. of Science
Symposium

Max Factor K.K.
Two Guides

McDonnell Douglas
Space Station Model

Miss Drill Team, U.S.A.
Performances

Motorola
"To Think" Movie

National Science Foundation
Seminar

Polaroid Corp. of Japan
National Day

Spacegear Corp.
Astronaut Spacesuit

Stanford University
Film, "The Art of Heuristic Programming"

Suntory Ltd.
National Day

Tennessee Children's Dance Ensemble
Performances

Texas Instruments Inc.
Display, "Road to AI"

TIME Magazine
Display, "Man of the Year"

Tokyo Kosei Wind Orchestra
Concerts

U.S. Air Force
Band Concerts

Xerox Palo Alto
Computer Graphics

Club Membership

Bruce L. Rechel
RCA Engineering Labs, Ltd.

Richard E. Handl
Tokyo Hilton International

Thomas R. Zengage
International Business Information K.K.

Robert F. Merino
Lockheed Aircraft (Asia) Ltd.

Yoshiro Ohbayashi
Ohbayashi Corporation

Norimichi Tohyama
American Family Life Assurance Co.

J.R. Wehrly
Dow Corning Japan Ltd.

Yutaka Maruta
Fame Corporation

Ira Caplan
American Cyanamid Company

John D. MacPhail
The Chase Manhattan Bank, N.A.

Dr. Albert L. Sieg
Kodak Japan K.K.

Thomas J. Rasmussen
Deloit Haskins & Sells

W.D. Lane
Acheson (Japan) Ltd.

Charles P. Pieper
General Electric Japan, Ltd.

H.T. Stiffl
Japan Upjohn Limited

R. Henry Marini
Revlon Kabushiki Kaisha

Masanobu Watanabe
Nihon Digital Equipment K.K.

Masaaki Matsushita
Shaklee Japan K.K.

Maurice W. Ranney
Union Carbide Japan K.K.

Dr. Luigi Strasorier
Perkin-Elmer Japan Co., Ltd.

Robert B. Kennard
Monsanto International

Osamu Fujiwara
Monsanto Japan Ltd.

R.A. Longmire
ESSO Sekiyu K.K.

Richard M. Norton
Pepsi Co. Inc., Japan Branch

Public Affairs

Events

3/28-29 International Communication Seminar, "Free Flow of Information: U.S.-Japanese Approaches to Communication Problems and Opportunities" [co-sponsored with the Tokyo American Center (USIS)]
Tsukuba Center for Institutes and U.S. Pavilion

5/5 Country Rhythm Cloggers
Pavilion Plaza

5/7-8 Concerts by U.S. Air Force Band of the Pacific
Expo Plaza

5/27-28 Lectures/Conference with Dr. Lejaren Hiller, State University of New York at Buffalo
Tsukuba University; Hydrotechnical Laboratory, Tsukuba Science City; U.S. Pavilion

6/6-7 Tokoku Journalists Seminar
"Communications into the 21st Century: Are the Technologies and Democratic Society Compatible?" [co-sponsored with the Sapporo American Center (USIS)]
Hotel Grand Shinonome, Tsukuba Science City; U.S. Pavilion

6/18-21 Participation in Expo '85 International Symposium III on "Science City"
Kyoto

7/1-5 U.S. National Day and Week Events
Harvard-Radcliffe Orchestra
Tokyo Kosei Wind Orchestra
Lewitzky Dance Company
Maile Aloha Singers
All-American Girls Drill Team
This Is My Country
Expo Plaza and Expo Hall

9/2 Buckles and Bows
Pavilion Plaza

9/7-8 Tennessee Children's Dance Ensemble
Expo Hall

National Week

Monday, July 1

Maile Aloha Singers (Expo Plaza)

Lewitzky Dance Company (Expo Hall)

Tuesday, July 2

Maile Aloha Singers (Expo Plaza)

Lewitzky Dance Company (Expo Hall)

Wednesday, July 3

This Is My Country (Expo Plaza)

Lewitzky Dance Company (Expo Hall)

Harvard-Radcliffe Orchestra

Open Rehearsal (Expo Plaza)

This Is My Country (Video only)(Expo Plaza)

Harvard-Radcliffe Orchestra (Expo Plaza)

Pops Concert

Thursday, July 4

United States National Day

National Day Ceremony (Expo Plaza)

Tokyo Kosei Wind Orchestra, conducted by
Frederick Fennell (Expo Plaza)

A Cavalcade of Popular Music in the USA

Harvard-Radcliffe Orchestra (Expo Plaza)

Pops Concert

Lewitzky Dance Company (Expo Hall)

This Is My Country (JumboTRON)

Tokyo Kosei Wind Orchestra, conducted by
Frederick Fennell (Expo Plaza)

A Cavalcade of Popular Music in the USA

Maile Aloha Singers (Expo Plaza)

Friday, July 5

Harvard-Radcliffe Orchestra (Expo Plaza)

Children's Concert

Lewitzky Dance Company (Expo Hall)

Miss Drill Team USA (Expo Plaza)

Maile Aloha Singers (Expo Plaza)

Staffing

Office of the Commissioner General

James J. Needham

Commissioner General

11/82-2/86

Allen E. Beach

Deputy Commissioner General
and Pavilion Director

7/83-10/85

Henry H. Goshō

Deputy Commissioner General
for Protocol & Public Affairs

2/85-9/85

Gilbert A. Robinson

Acting Commissioner General

6/82-11/82

Gordon Winkler

Associate Commissioner General

5/84-11/84

Charles H. Clarke

Deputy Commissioner General
and Project Director

2/83-5/84

E. David Seal

Deputy Commissioner General
for Washington Office

11/84-5/85

Susan M. Doane

Special Assistant to the Deputy Commissioner
General

7/84-10/85

Eileen M. Finegan

Executive Secretary to the
Commissioner General

1/84-3/86

Michiko Nishimura

Executive Secretary to the
Commissioner General in Tokyo

2/85-9/85

Irene Ohta

Executive Secretary to the
Deputy Commissioner General

3/84-11/85

Exhibit and Management

Christopher L. Arnold

Deputy Project Director and
Director of Corporate Relations

9/83-11/85

Gloria Burke

Corporate Liaison Coordinator

2/84-8/85

Dale Morrison

Technical Content Coordinator

6/84-8/84

James E. Ogul

Director of Exhibits

12/84-10/85

Arthur Yahiku

Technical Director

6/84-9/85

Administration

Harold J. Ashby, Jr.

Budget and Fiscal Analyst

3/84-11/85

Howard E. Daniel

Director of Events

7/84-10/85

Harriet Doolittle

Administrative Assistant

1/85-4/85

Jerry Hunsaker

Chief Executive Officer

8/84-12/85

Katy Kalb

Executive Officer

9/84-8/85

Shozo Matsuzaki

Assistant Budget Analyst

4/85-10/85

Douglas Smith

Event Coordinator

9/82-8/84

Paul Starzynski

Audiovisual Coordinator

2/83-12/84

Michiko Yoshida

Office Manager

2/85-10/85

Other Staff

Sam Anderson

Secretary

2/84-5/84

Susan Catterson

Secretary

9/83-2/84

Robert Franki

Technician

3/85-9/85

Tetsuo Fukuda

Driver

2/85-9/85

Alice Gardiner

Secretary

5/84-1/85

Candace Hall

Secretary

6/84-3/85

Toshikazu Hatae

Technical Aide

3/85-9/85

Mary Hebb

Executive Secretary to
Project Director

2/83-5/84

Fujika Imaike
Secretary
2/85-6/85

Michiko Kandatsu
Secretary
3/85-10/85

Motokazu Kawamura
Driver
3/85-10/85

Makoto Kobayashi
Contract Photographer
7/85-9/85

Akiko Koizumi
Secretary
3/85-9/85

Kuniaki Okiyama
Driver
4/85-10/85

Yukio Miyaji
Driver
2/85-9/85

Yolanda Scott
Secretary
6/84-4/85

Jonathan Sharpe
Chief Projectionist
3/84-10/85

Yukiko Shiraishi
Secretary
4/85-10/85

Yasumichi Tazawa
Driver
3/85-10/85

Moriji Tokue
Driver
3/85-9/85

Takamichi Yahagi
Dispatcher
3/85-11/85

Guides

Craig Andrew
Brent Baum
James Chrosniak
Millie Creighton
Paul Dame
Michael Feters
Fumi Fowells
Rika Fujita
Shuri Fukunaga
Mari Hamada
Rodney Harada

Lee Hawks
Kyoko Higashikawa
Michael Holbrook
Kay Ida
Clint Jordon
Jeffrey Lewis
Jeffrey Manning
Lena Marshall
John McGuire
David Noble
Masako Ogawa
Mika Ogura
Yuki Sato
Ikuko Sanematsu
Joseph Schmidt
Collin Seda
Akiko Shimooka
Eugene Skinner
James Skinner
Howard Snyder
Hiromi Uozaki
Miyuki Wakita
Josephine Weisner
Thomas Werre
Allan West
Yoko Yasui
Faith Young

Other USIA Support

Executive Office & Office of Exhibits
Joan Beverly
Daniel S. Campbell
Florence Douglas
Shirley Ginyard
Peggy Lovelie
Nellie Nelson
Donna Weiskopf

Logistics Support/Office of Exhibits
Mary Ann Foley
Eugene Adams
Jim Bigart
Gloria Brockenberry
Glenda Dudley
Marguerite Suite
Ernst Frank

Office of Contracts
Phil Rogers
John Busch

Office of Foreign Service Personnel
Gloria Brown
Velma Chevalier

Office of the General Counsel
Merry Lynn

USIS Tokyo
U.S. Embassy in Tokyo

Major Contractors

All Nippon Building Maintenance Assn., Inc.
Custodial Service

Asakuma Co., Ltd.
Restaurant

Boston Light and Sound, Inc.
Theater

Century III Teleproductions
Audio Visual

ComCorps, Inc.
Theater Film

Daniel J. Edelman, Inc.
Public Relations

Defense Contract Audit Agency
Audit Assistance

Far East Security Company
Guard and Security Service

JAIET
Pavilion Contractors

Japan Housing and Urban Development Corp.
Housing

Herb Rosenthal and Associates, Inc.
Exhibit Designer

Maki and Associates
Architect Design

Mitsui Construction Co., Ltd.
Constructors for JAIET

Mitsui Construction Co., Ltd.
Modification and Demolition

Mitsubishi Electric Corporation
Electrical Installations

Nippon Express Co., Ltd.
Freight Forwarding

Nomura Display Co., Ltd.
Exhibit Fabrication and Installation

Sea-Land Service, Inc.
Sea Shipping

Senyo Kogyo Co., Ltd.
Gift Shops

Toppan Printing Co., Ltd.
General Administrative Service

Toshiba
Relief Projectionist

U.S. Army Corp of Engineers
Engineering Assistance

Budget	Obligations	In-kind/Cash Contributions
Design/Development		
Design Contract	\$ 414,098	—
Other Art Work	20,338	—
Photo Services	11,451	—
Research	60,500	—
Audio-Visual Contract	793,380	\$ 61,295
Translations	44,740	—
Other Contracts	79,346	—
Sub-total	\$ 1,423,854	\$ 61,295
Production		
Landscaping	\$ 34,769	—
Architectural Modification	455,408	479,262
Installation/Construction	231,561	—
Exhibit Fabrication	1,893,502	—
Striking	50,612	—
Display Materials	112,193	3,817,436
Audio-Visual Hardware	76,831	460,855
Theater Construction	210,036	—
Equipment/Furniture Purchase	1,684	56,450
Equipment Rental	29,726	21,680
Sub-total	\$ 3,096,322	\$ 4,835,683
Operations		
Pavilion Rent	\$ 805,380	—
Utilities	281,009	\$ 350,000
Security/Guide Contracts	160,417	—
Custodial Services	94,466	—
Insurance	75,481	—
Photo Services	3,391	—
Contract Mgt. Fee	234,764	—
Sub-total	\$ 1,654,908	\$ 350,000
Logistics		
Shipping To Site	\$ 96,127	\$ 50,000
Shipping From Site	71,522	—
Local Drayage	47,549	2,200
Storage	10,227	—
Container Lease	1,958	—
Misc. Shipping/Courier	15,183	—
Sub-total	\$ 242,566	\$ 52,200

	Obligations	In-kind/Cash Contributions
Administration		
Office Supplies	\$ 64,987	\$ 5,775
Office Equipment Rental	27,342	—
Office Equipment Purchase	15,471	—
Resident Supplies	21,079	7,500
Resident Furniture Rental	123,035	—
Resident Furniture Purchase	48,871	8,000
Rent Residences	276,958	—
Utilities—Residential	54,138	—
Telephone/Toll Calls	79,703	—
Vehicle Rental	30,629	256,600
Gas/oil/maintenance	15,477	—
Personnel Salaries	1,228,818	39,000
Allowances	15,905	—
Personal Advertising	6,244	—
Security Clearances	44,175	—
Contract Services	94,450	—
Sub-total	\$ 2,148,282	\$ 316,875
Participation Promotion		
Contract Services	\$ 156,197	—
Supplies	20,940	—
Sub-total	\$ 177,137	\$ —
Public Affairs/Protocol		
Promotionals	\$ 17,572	\$ 8,140
Collateral Programs	30,736	39,000
Sub-total	\$ 48,308	\$ 47,140
Printing		
Seminar/Research Printing	\$ 163,369	\$ 60,000
Brochure Printing	10,830	—
Administrative Printing	31,792	—
Sub-total	\$ 205,991	\$ 60,000
Travel		
Domestic Travel	\$ 79,668	—
International Travel	458,927	\$ 125,000
Sub-total	\$ 538,595	\$ 125,000
Grand Total	\$ 9,535,962	\$5,848,193
Total Available		
Appropriation	\$ 8,565,005	
Reimbursements	276,559	
Rental Income	293,677	
Concessions	111,180	
Cash Donations/Interest	867,032	
Misc. Deposits	347	
Total	\$10,113,800	

We are grateful to Texas Instruments Incorporated for providing a personal computer
for initial preparation of this report.



Final Report United States Pavilion Tsukuba Expo '85